

CLINICOMYCOLOGICAL PROFILE OF THE DERMATOPHYTES AND ITS ANTIFUNGAL SUSCEPTIBILITY PATTERN IN PATIENTS ATTENDING DERMATOLOGY OUT PATIENT DEPARTMENT IN A TERTIARY CARE HOSPITAL.

INTRODUCTION

Dermatophytes are the most common agent of fungal infections worldwide, which consists of a group of morphologically and physiologically related filamentous fungi with the capacity to penetrate keratinized tissues of humans and other animals and produce dermatophytosis. Dermatophytosis is highly contagious and represents a major public health problem. World Health Organization estimates that the global prevalence of superficial fungal infections has been found to be 20-25% . Studies on dermatophytosis in India have received increased attention in recent years because one fifth of the world's population suffers from superficial mycosis.

Based on clinical, morphological and microscopic characteristics, dermatophytes are classified into three genera; (1) Trichophyton, (2) Microsporum, and (3) Epidermophyton.

Modified Sabouraud's Dextrose Agar (SDA) with cycloheximide, chloramphenicol and gentamycin is used for the culture of the dermatophytes. There are many antifungal agents that are available to treat dermatophytes. But not all species of dermatophytes have the same susceptibility pattern and relative or absolute resistance may occur. The choice of proper treatment is determined by the site and extent of the infection, the species involved the efficacy, safety profile, and the kinetics of the available drugs.

KEY WORDS

Dermatophytes, Prevalence , Antifungal Susceptibility Testing, Microbroth Dilution method, Griseofulvin, Ketoconazole, Itraconazole, Fluconazole, Terbinafine.

AIMS AND OBJECTIVES

- To study the prevalence of superficial mycoses in patients attending dermatology outpatient department.
- To isolate and speciate the dermatophytic agents from clinical specimens like skin, hair and nail obtained from patients attending dermatology OPD.
- To study the clinical and mycological profile of superficial mycoses.
- To identify the commonest prevalent genus and species of dermatophytes.
- To correlate different species of dermatophytes and its clinical manifestation.
- To study the antifungal susceptibility pattern of the isolated fungi.
- To determine the MIC values of different drugs for the isolates.

MATERIALS AND METHODOLOGY

Study design : Prospective study

Study period : March 2015- Feb 2016

Study Duration : 1 year

Study setting : Hospital based

Study subjects : Patients attending Dermatology outpatient department with clinical features suggestive of superficial mycoses.

Sample size : 100

Sampling method : Consecutive sampling

INCLUSION CRITERIA

- 1 . Patients of all age group with clinical features suggestive of superficial mycoses attending Dermatology outpatient department.
2. Patients who are on regular follow up

EXCLUSION CRITERIA

1. Patients who are on anti-fungal therapy
2. Defaulters
3. Antenatal cases
4. Patients who are immunocompromised
 - Uncontrolled Diabetes mellitus
 - Acquired immunodeficiency syndrome
 - Malnutrition
 - Chronic liver and renal diseases
 - Malignancy
 - Patients on chronic immunosuppressive therapies like steroids , long term antibiotics, anti-cancerous drugs

SAMPLE SPECIFICATION

- Skin Scrapings
- Nail Clippings

- Hair

PROCEDURE

Clean the site with 70% alcohol prior to collection of the sample.

The clinical specimens (skin scrapings, infected hair roots , nail clippings) are collected and immediately transported to the microbiological laboratory.

MICROBIOLOGICAL INVESTIGATIONS

a) KOH mount examination

Direct microscopic examination for the detection of fungal hyphae is undertaken in 10% potassium hydroxide (KOH) wet mount for the specimens of skin scales , while 40% KOH is employed for the specimens of hair roots and nail clippings .

b) CULTURE STUDY

i) SABOURAUDS DEXTROSE AGAR –

Samples are inoculated into two sets of media.

- One on Sabourauds Dextrose Agar with Chloramphenicol
- Another on Sabourauds Dextrose Agar with Chloramphenicol and Actidione
- Both the culture tubes are incubated at two different temperatures of 25°C and 37°C for 21 days⁽⁷⁾.
- The tubes will be examined for the presence of fungal growth daily for the 1st one week , alternate days for the next one week, every 5 days for the third week.

ii) DERMATOPHYTE TEST MEDIUM

- Special media for the isolation of dermatophytes.

- Observations are done like that of SDA.
- The pure cultured fungal isolates will be identified by colony morphology, Lacto Phenol Cotton Blue mount , Gram's stain and will be speciated by means of Hair perforation test and Biochemical reactions.

c) ANTI-FUNGAL SUSCEPTABILITY

Anti –fungal susceptibility for the isolated fungi was done by Micro Broth Dilution methods , as per CLSI Guidelines.

RESULTS

1. Out of the 100 patient with dermatophytosis studied,
2. The commonest age group affected were 11-20 (25%) followed by 31-40(24%).
3. Male to female ratio was 1.27:1.
4. It was more common in farmers (37%) followed by hostellers (23%).
5. The commonest skin lesion was tinea corporis 46(62.2%) followed by tinea cruris 16(21.6%).
6. The direct microscopy (KOH) was positive in 35(35%) and culture in 40(40%) of clinically diagnosed cases.
7. Isolation rate in culture media namely SDA and DTM were the same but earliest in DTM (5-7days).
8. Samples were skin, hair and nail. The commonest isolates were dermatophytes 40(40%) followed by candida and nondermatophyte 32 (32%). Among the total dermatophytes isolated, *Trichophyton rubrum* 18(45%) was the commonest pathogen.

9. Antifungal susceptibility testing was performed by microbroth dilution method for griseofulvin, ketoconazole, fluconazoles, itraconazole and terbinafine.
10. Among the total dermatophytes isolated, three isolates showed resistance to antifungal agents (Terbinafine, ketoconazole and itraconazole). One was to itraconazole alone, other to terbinafine alone and the third one was to both ketoconazole and terbinafine.

CONCLUSION

Dermatophytosis accounts the common cutaneous manifestation and especially onychomycosis which can act as a chronic reservoir. The chronicity and tissue disruption can lead to secondary bacterial infection.

Clinical suspicion, early laboratory examination to confirm diagnosis and appropriate treatment is very crucial in this group of patients. Direct microscopic examination and culture identification plays the major part in the management. Though Sabouraud dextrose agar with antimicrobials which needs incubation for 4-8 weeks, is the commonly used media for isolation, Dermatophyte test medium which give presumptive identification within a week can be used instead in these group of patients.

Apart from dermatophytes, which is the commonest isolates in superficial mycoses, other agents like Candida and non dermatophyte moulds which were considered as contaminants or coloniser is also emerging as a pathogen especially in these group of patients. Hence repeated isolation will prove its pathogenicity.

Though early complete course of treatment gives mycological cure, resistant strains are also occurring, which can act as a chronic reservoir of infection. Hence routine antifungal susceptibility testing has to be done routinely for timely interventions.